What is claimed is:

1. A method of monitoring the conditions of engine lubricant in real time during operation comprising:

    (A) immersing a probe with a pair of spaced parallel conductors in the fluid to be monitored;

    (B) exciting of said pair of electrodes with an alternating voltage at a first relatively high frequency and exciting said one conductor at a second relatively low frequency and measuring the current at said first and second frequencies;

    (C) computing the bulk fluid impedance at said first frequency and the fluid-electrode interface (surface) impedance at the said second frequency and computing the impedance difference (dZ) therefrom;

    (D) delaying for a selected time interval and repeating steps (A)-(C) and computing another value of dZ;

    (E) computing the rate of change of dZ (ΔdZ) for a selected time interval (Δt) and determining the value of the remaining useful life (RUL) of the lubricant from the following:

        (i) determining the value of a physiochemical parameter (X) when ΔdZ is positive from lubricant with known amounts of constituents selected from the group consisting of (a) Phosphorus, Oxygen and Carbon (P-O-C); (b) Phosphorous and double bond Sulphur (P = S); (c) Zincdialkyldithiophosphate (ZDDP); and (d) the Total Base Number TBN by measuring $CaCO_3$ (CO3), from a table of the selected parameter X versus dZ in a first region of the table and determining RUL from a table of RUL versus parameter X (X_1);

        (ii) determining the value of the selected parameter X when ΔdZ is negative from a second region of the table of X versus dZ;

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(F)   repeating steps (B) – (E) after a selected time delay Δt and determining a second value of X (X$_2$) computing the rate of change of X, $\Psi = \dfrac{X_2 - X_1}{\Delta t}$; and,

(G)   computing the remaining useful life (RUL) expressed as a percentage by dividing the difference in X from a known X$_{EOL}$ by the rate of change $\Psi\left(RUL = \dfrac{X - X_{EOL}}{\Psi} \right)$

2.   The method defined in claim 1, wherein said step (E)(ii) includes determining that ΔdZ has a negative slope greater than about one.

3.   The method defined in claim 1, wherein the step of exciting one of said electrodes includes applying an alternating current voltage of note more than about one Volt RMS.

4.   The method defined in claim 1, wherein said step of determining the value of RUL if ΔdZ is negative includes determining if dZ is less than about 25% of dZ$_{MAX}$ and if affirmative providing an indication that RUL is near zero.